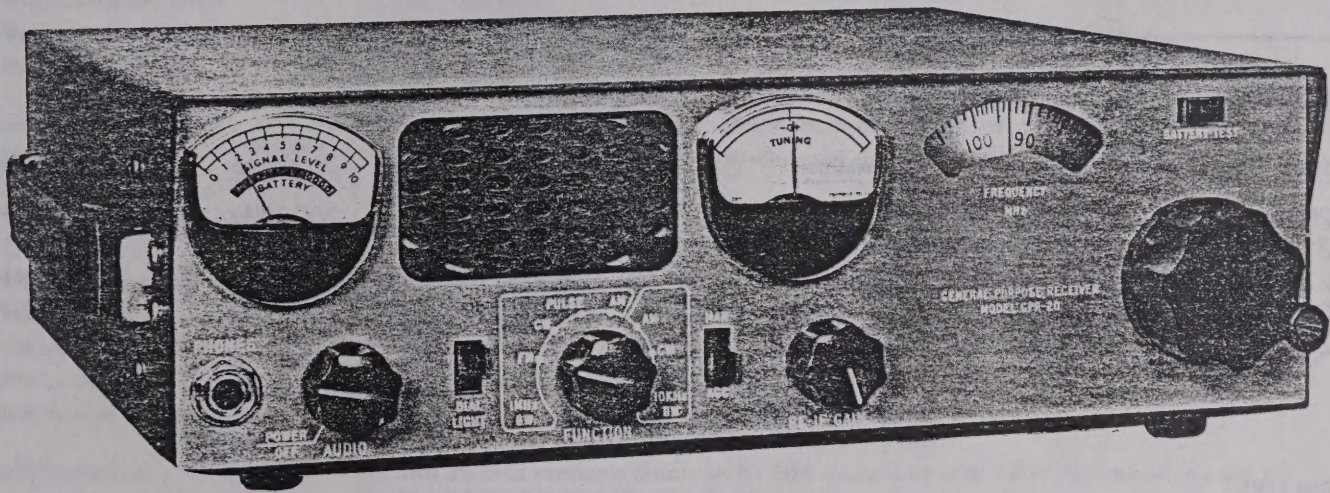


HARTMAN SYSTEMS



TELEMETRY

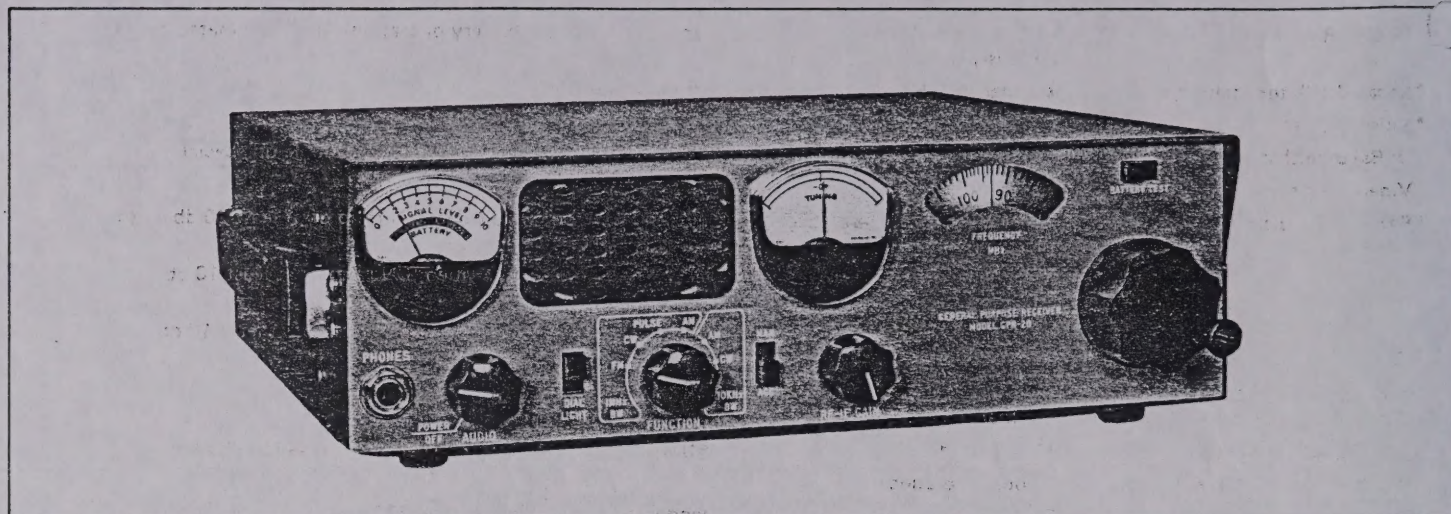
General Purpose Receiver GPR-20 Series



FEATURES

- LOW NOISE FIGURE—TYPICALLY 5.5 db MAX. BELOW 200 MHz, 6.5 db MAX. ABOVE 200 MHz.
- LOW OSCILLATOR RADIATION—TYPICALLY LESS THAN 15 MICROVOLTS.
- HIGH PERFORMANCE AGC FOR CONSTANT AM AND PULSE OUTPUT.
- HIGH CAPTURE FM DEMODULATOR (.91 TYPICAL) FOR MINIMUM MULTIPATH DISTORTION IN AIRBORNE AND SHIPBOARD APPLICATIONS.
- LOW 300 MILLIWATT POWER CONSUMPTION PROVIDES 250 HOUR CARBON-ZINC BATTERY LIFE.
- LIGHT WEIGHT—LESS THAN 10 POUNDS.
- SMALL SIZE—3.75 IN. HIGH (LESS ANTENNA) BY 11.81 IN. WIDE BY 11.81 IN. DEEP.
- MTBF—25000 HOURS

GPR-20



GPR-20 SERIES

<u>MODEL NO.</u>	<u>FM/AM/ CW PULSE</u>	<u>AM/CW</u>	<u>MODEL NO.</u>	<u>FM/AM/ CW PULSE</u>	<u>AM/CW</u>
GPR-20	1 MHz	10 KHz	GPR-25	300 KHz	50 KHz
GPR-21	500 KHz	10 KHz	GPR-26	1 MHz	100 KHz
GPR-22	300 KHz	10 KHz	GPR-27	500 KHz	100 KHz
GPR-23	1 MHz	50 KHz	GPR-28	300 KHz	100 KHz
GPR-24	500 KHz	50 KHz			

SYSTEM USE:

The GPR-20 Series receivers are compact, lightweight units which can receive AM, Pulse, FM and CW signals in the 55-260 MHz frequency range for use in surveillance, quick look telemetry, RFI, spectrum analysis and communications applications. Bandwidths of 1 MHz and 10 KHz are standard for the GPR-20. Vernier tuning simplifies accurate tuning when using the narrow bandwidth. Gain may be manually or automatically controlled, and an RF-IF gain control is provided for the manual gain control mode. Audio may be monitored using the large front panel speaker or with headphones.

The GPR-20 units are completely portable, powered by ten self-contained standard carbon-zinc 1.5 volt dry cells. An optional interval power pack (PP-20) is available for 115-230 Volt, 50-400 Hz operation. Other options include the RA-20 rack adapter, the CC-20 fitted carrying case and special IF bandwidths.

SYSTEM COMPONENTS:

MODEL GPR-20 GENERAL PURPOSE RECEIVER

The GPR-20 receiver is available with the following options:

Rack Adapter (Model RA-20) for standard 19 inch racks

Carrying Case (Model CC-20)—fitted, splashproof, suitably padded; includes headphones and tool kit

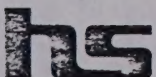
Power Supply (Model PP-20)—modular, plug-in; for use with 115/230 volts, 50-400 Hz

Special IF Bandwidths

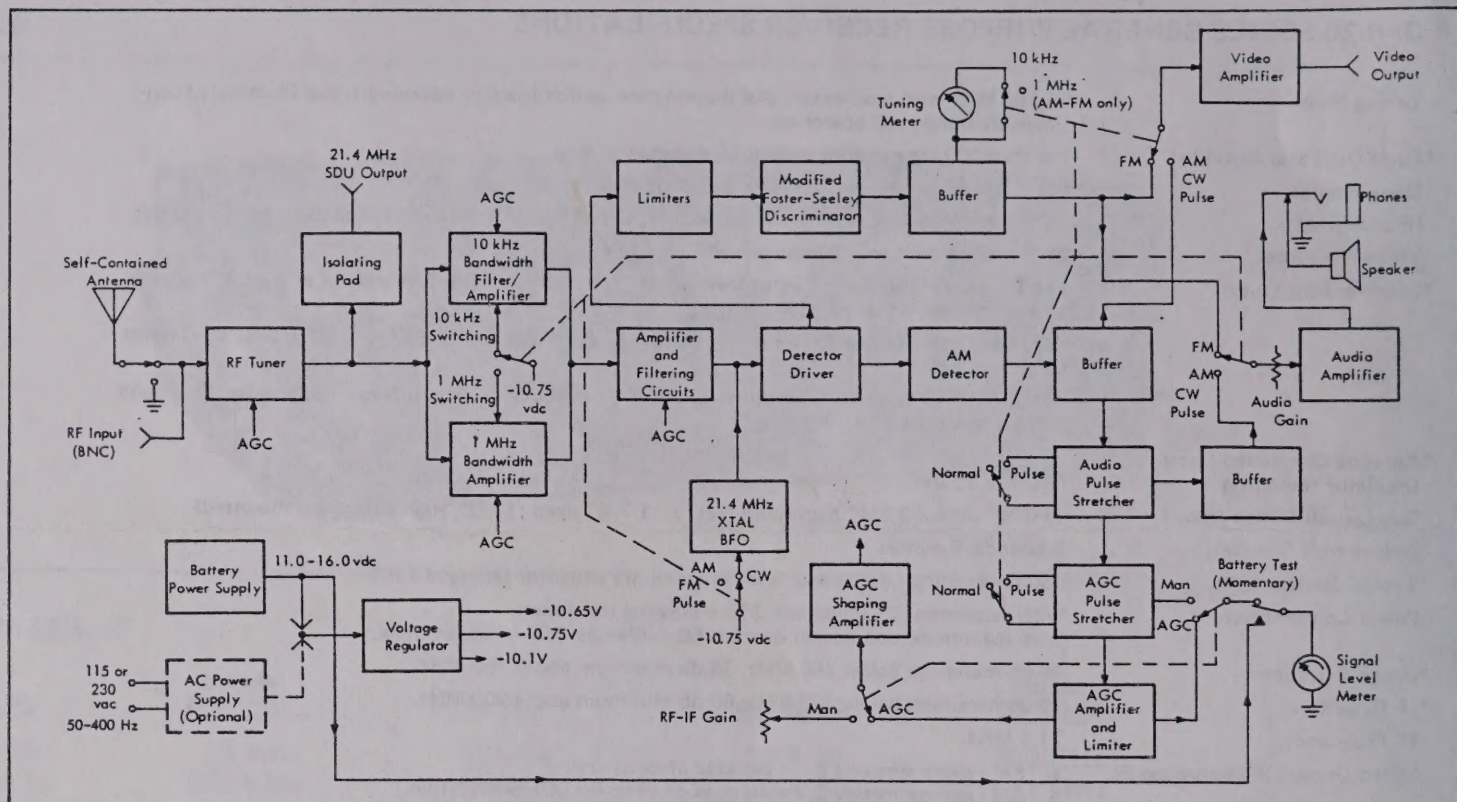
Special Treatment for severe environmental conditions

GPR-20 SERIES GENERAL PURPOSE RECEIVER SPECIFICATIONS

Tuning Range:	55-260 MHz with momentary dial illumination switch (battery operation); dial illuminated continuously during AC operation.
*Local Oscillator Stability:	less than 100 Hz per minute after 30-minute warmup.
*Noise Figure:	5.5 db maximum below 200 MHz, 6.5 db maximum above 200 MHz.
IF Bandwidths:	1.0 MHz; FM, AM, CW, Pulse. 10 kHz; AM, CW. Other IF bandwidths available on special order.
Video Response:	20 Hz to 500 kHz into 600-ohm load.
*Receiver Sensitivity:	FM, 1 MHz IF BW: An RF input level of 10 μ v produces a video S/N ratio of at least 20 db, with a frequency deviation of \pm 300 kHz. AM, 1 MHz IF BW: An RF input level of 5.0 μ v produces a video S/N ratio of at least 10 db with 50% modulation. AM, 10 kHz IF BW: An RF input level of 0.5 μ v produces a video S/N ratio of at least 10 db with 50% modulation.
*Antenna Conducted Local Oscillator Radiation:	less than 15 μ v.
Size Overall Dimensions:	11-7/8" wide x 3-3/4" high (with feet) x 11-7/8" deep (3-1/2" High when rack mounted).
Weight with Dry Cells:	9 pounds, 6 ounces.
Typical Battery Life:	250 hours using phones and recommended dry cells (Burgess type 210).
Power Consumption:	With earphones: 25 milliamps, 375 milliwatts maximum. With maximum loudspeaker output: 50 milliamps, 750 milliwatts max.
*Image Rejection:	40 db minimum below 150 MHz, 30 db minimum above 150 MHz.
*IF Rejection:	70 db minimum below 200 MHz, 60 db minimum above 200 MHz.
IF Frequency	21.4 MHz.
Video Output (600-ohm load):	a. FM - approximately 5 mv per kHz of deviation. b. AM - approximately 2.2 volts peak-to-peak for 50% modulation.
*FM Frequency Response:	1 MHz IF BW: less than 3 db down from 35 Hz to 400 kHz with modulation index less than 0.6.
*FM Distortion:	less than 1% total harmonic distortion with 1 kHz modulation rate, 200 kHz peak deviation.
*FM Output Stability:	1 MHz IF BW: less than 1 db overall variation from 2 μ v to 100 mv.
*FM Limiter	35 db of limiting on receiver noise with AGC.
*AM Frequency Response:	1 MHz IF BW: less than 3 db down from 35 Hz to 450 kHz. 10 kHz IF BW: less than 3 db down from 35 Hz to 4.5 kHz.
*AM Distortion:	less than 3% total harmonic distortion for 50% modulation with 1 kHz modulation rate and RF input level from less than 10 μ v to 50 mv.
*AM Output Stability:	a. 1 MHz IF BW: less than 3 db overall variation from 3 μ v to 50 mv. b. 10 kHz IF BW: less than 3 db overall variation from 0.4 μ v to 50 mv.
*Dynamic Range (AM Modes):	corresponding RF input level range from +10 db S/N ratio to 10% total harmonic distortion. 1 MHz IF BW: 88 db with AGC. 10 kHz IF BW: 108 db with AGC.
Beat Frequency Oscillator:	crystal-controlled, operable in either IF bandwidth.
RF-IF Gain Control:	AGC, Pulse AGC, or manual.
Pulse Reception:	for PRF from 60 pps to 10K pps, pulse widths from 2 μ s up. Audio Monitor output is enhanced by pulse stretching.
*Tangential Sensitivity:	Pulse 1 MHz IF BW: -98 dbm, with a 6 μ s pulse width at a 1 kHz repetition rate.
*Pulse Output Stability:	less than 3 db variation for RF input level from 4 μ v to 50 mv with pulse width \geq 2 μ s. less than 3 db variation for pulse repetition rate from 60 Hz to 10 kHz with pulse width \geq 2 μ s.
Meters:	a. Tuning - reads average discriminator output. b. Signal Level - reads relative signal level when AGC is used. Reads AM detector output when manual gain control is used. Also indicates battery condition by front-panel momentary switch.
Audio-Monitor:	built-in audio amplifier and speaker with provision for headphones. Front-panel gain control independent of video output. Speaker is disconnected when headphones are used.
RF Input:	from 50 ohm source or self-contained telescoping antenna.
Provision for Signal Display Unit:	21.4 MHz output frequency; compatible with DEI SDU-20.
Power Requirements:	10 standard 1-1/2 volt dry cells (Burgess type 210 recommended for maximum battery life) or optional internal power pack for 115-230V, 50-400 Hz operation.
Finish:	two-tone brown; non-reflective black or other finishes available on special order.
*Typical Performance	



GPR-20 FUNCTIONAL BLOCK DIAGRAM



GPR-20 SERIES GENERAL PURPOSE RECEIVER

